

**Listing of Claims**

1-20. (Canceled)

21. (Currently Amended) A semiconductor photodetection detector, comprising:

a semiconductor substrate of a first conductivity type;

a photodetection layer formed on said semiconductor substrate;

a region of a second conductivity type opposite to said first conductivity type being formed in a part of said photodetection layer; and

an electrode applying an electric field to said photodetection layer via said region of said second conductivity type such that said electric field acts in a thickness direction of said photodetection layer,

said photodetection layer comprising: a first semiconductor layer having a first thickness and accumulating therein a compressive strain and absorbing an optical radiation; and a second semiconductor layer having a second thickness smaller than said first thickness and accumulating therein a tensile strain, said first semiconductor layer and said second semiconductor layer being stacked alternately and repeatedly in said photodetection layer,

wherein a total of said first thicknesses is smaller than a thickness value  $L_w$  below which a flat surface appears at a top surface of said photodetection layer and above which an irregular surface appears at said top surface of said photodetection layer, said thickness value  $L_w$  being represented by a relationship

$$L_w = A \times \epsilon W + L,$$

where  $A$  represents a negative constant,  $\epsilon W$  represents said compressive strain, and  $L$  represents a constant.

22. (Previously Presented) A semiconductor photodetection device as claimed in claim 21, wherein said first semiconductor layer accumulates therein a strain of 0.2% or more but not exceeding 0.6%.

23. (Previously Presented) A semiconductor photodetection device as claimed in claim 21, wherein said first semiconductor layer has a thickness of 50 nm or more.

24. (Previously Presented) A semiconductor device as claimed in claim 21, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of  $(0.9 \times L^{1/4} \times \epsilon)$  in terms of microns, wherein  $\epsilon$  represents that strain accumulated in said first semiconductor layer and  $L$  represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

25. (Previously Presented) A semiconductor photodetection device as claimed in claims 23, wherein the second thickness of the second semiconductor layer is smaller than one-half the first thickness of the first semiconductor.

26. (Previously Presented) A semiconductor device as claimed in claim 25, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of  $(0.9 \times L^{1/4} \times \epsilon)$  in terms of microns, wherein  $\epsilon$  represents the strain accumulated in said first semiconductor layer and  $L$  represents a sum of a total thickness of said

first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

27. (Previously Presented) A semiconductor photodetection device as claimed in claim 21, wherein each of said first and second semiconductor layers comprises a ternary compound semiconductor material.

28. (Previously Presented) A semiconductor device as claimed in claim 25, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of  $(0.9 \times L^{1/4} \times \epsilon)$  in terms of microns, wherein  $\epsilon$  represents the strain accumulated in said first semiconductor layer and  $L$  represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

29. (Previously Presented) A semiconductor photodetection device as claimed in claim 21, wherein said substrate comprises n-type InP and said first and second semiconductor layers comprise n-type InGaAs.

30. (Previously Presented) A semiconductor device as claimed in claim 29, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of  $(0.9 \times L^{1/4} \times \epsilon)$  in terms of microns, wherein  $\epsilon$  represents the strain accumulated in said first semiconductor layer and  $L$  represents a sum of a total thickness of said

first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

31. (Previously Presented) A semiconductor photodetection device as claimed in claim 21, further comprising an intermediate layer between said first and second semiconductor layers, said intermediate layer having an intermediate bandgap between a bandgap of said first semiconductor layer and a bandgap of said second semiconductor layer.

32. (Previously Presented) A semiconductor device as claimed in claim 31, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of  $(0.9 \times L^{1/4} \times \epsilon)$  in terms of microns, wherein  $\epsilon$  represents the strain accumulated in said first semiconductor layer and  $L$  represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

33. (Previously Presented) A semiconductor photodetection device as claimed in claim 31, wherein said intermediate layer is provided at a side of said first semiconductor layer closer to said region of said second conductivity type.

34. (Previously Presented) A semiconductor photodetection device as claimed in claim 31, wherein said intermediate layer has a composition profile that changes gradually in a thickness direction thereof.

35. (Previously Presented) A semiconductor photodetection device as claimed in claim 34, wherein said intermediate layer accumulates a tensile strain at a side thereof contacting said second semiconductor layer and a compressive strain at a side thereof contacting said first semiconductor layer.

36. (Previously Presented) The semiconductor photodetection device as claimed in claim 21, wherein a total thickness of said first and second semiconductor layers is  $1.3\mu\text{m}$ .

37. (Previously Presented) The semiconductor device as claimed in claim 36, wherein said constant A takes the value of  $-1\mu\text{m}/\%$ .

38. (New) The semiconductor photodetection device as claimed in claim 21, wherein said total thickness of said first and second semiconductor layers is equal to or smaller than  $1.334\mu\text{m}$ .

39. (New) The semiconductor photodetection device as claimed in claim 21, wherein said total of said first thicknesses is equal to or smaller than  $1.334\mu\text{m}$  but no smaller than  $0.6\mu\text{m}$  and said compressive stress is larger than 0% but not exceeding 0.72%, wherein a combination of  $0.2\mu\text{m}$  for said total of said first thicknesses and 0.25% for said compressive stress is excluded.